IN THE CLAIMS

1. (canceled)

1 2. (currently amended) A noise canceling method comprising the steps of:

periodically inserting a zero-point into a transmission signal,

establishing synchronization based on a received signal,

extracting the zero-point based on the established synchronization and interpolating a noise component of the received signal by using the zero-point, and

subtracting the noise component from the received signal,

wherein the step of interpolating includes steps of performing a frequency shift of the received signal to a desired frequency bandwidth, decimating according to the zero-point, performing an interpolation, and finally performing the frequency shift in a reverse direction so as to adjust to an original signal, thereby generating the noise component of the received signal.

2 3. (previously presented) The noise canceling method as claimed in claim 1 2, wherein one or more zero-points are inserted at intervals of an integer number of samples.

3 4. (previously presented) The noise canceling method as claimed in claim 2 3, wherein an inserted number of the zero-points is determined by deciding a signal quality on a the reception side to be notified to a the transmission side.

4 5. (previously presented) The noise canceling method as claimed in any one of claims 1 2 to 4 wherein a transmission line of the received signal includes a transparent transmission line.

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5 8. (previously presented) The noise canceling method as claimed in claim 4, wherein the transparent transmission line includes a Nyquist transmission line.

7. (canceled)

6 8. (currently amended) The noise canceling method as claimed in claim [[7]] 1, wherein for the step of interpolating, the zero-point is inserted into the decimated signal, and a low-pass filter process for making an interpolation bandwidth a transmission bandwidth is further performed.

7 9. (previously presented) The noise canceling method as claimed in claim 6, wherein the low-pass filter process includes a cos-squared filter process for making the interpolation bandwidth a Nyquist bandwidth.

8 10. (previously presented) The noise canceling method as claimed in claim 6, wherein the low-pass filter process includes a cos filter process for making the interpolation bandwidth a Nyquist bandwidth.

9 11. (currently amended) The noise canceling method as claimed in claim [[7]] 1, wherein a frequency bandwidth, in which a noise frequency component is large, is detected in

the received signal so that the amount of the frequency shift is automatically determined for the desired frequency bandwidth.

10 12. (previously presented) The noise canceling method as claimed in any one of claims 1 to 3 wherein an automatic equalizing process is further performed so as to remove an intersymbol interference at a former or latter stage of a noise cancellation.

13. (canceled)

11 14. **(currently amended)** A noise canceling apparatus comprising:

means periodically inserting a zero-point into a transmission signal,

means establishing synchronization based on a received signal,

means extracting the zero-point based on the established synchronization and interpolating a noise component of the received signal by using the zero-point, and

means subtracting the noise component from the received signal,

wherein the means for interpolating include means for performing a frequency shift to the received signal to a desired frequency bandwidth, means for decimating according to the zero-point thereafter, means for further performing an interpolation, and means for performing the frequency shift in a reverse direction so as to adjust to an original signal, thereby generating the noise component of the received signal.

12 15. (previously presented) The noise canceling apparatus as claimed in claim 14, wherein one or more zero-points are inserted at intervals of an integer number of samples.

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13 16. (previously presented) The noise canceling apparatus as claimed in claim 12 15, wherein an inserted number of the zero-points is determined by deciding a signal quality on a the reception side to be notified to a the transmission side.

14 17. (previously presented) The noise canceling apparatus as claimed in any one of claims 11 14 to 13 16 wherein a transmission line of the received signal includes a transparent transmission line.

15 18. (previously presented) The noise canceling apparatus as claimed in claim 14 17, wherein the transparent transmission line includes a Nyquist transmission line.

19. **(canceled)**

16 20. **(currently amended)** The noise canceling apparatus as claimed in claim [[19]] 11 14, wherein the interpolation means include a circuit for inserting the zero-point ~~points~~ into the decimated signal, and further include a low-pass filter for making an interpolation bandwidth a transmission bandwidth.

17 21. (previously presented) The noise canceling apparatus as claimed in claim 16 20, wherein the low-pass filter includes a cos-squared filter for making the interpolation bandwidth a Nyquist bandwidth.

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18 22. (previously presented) The noise canceling apparatus as claimed in claim 16 20, wherein the low-pass filter includes a cos filter for making the interpolation bandwidth a Nyquist bandwidth.

19 23. **(currently amended)** The noise canceling apparatus as claimed in claim [[19]] 11 14, wherein the means for performing the frequency shift include means for detecting a frequency bandwidth, in which a noise frequency component is large, in the received signal so that the amount of the frequency shift is automatically determined for the desired frequency bandwidth.

20 24. (previously presented) The noise canceling apparatus as claimed in any one of claims 11 14 to 13 16 wherein an automatic equalizer is further provided for removing an intersymbol interference at a former or latter stage of a noise cancellation.

25. **(canceled)**

21 26. **(currently amended)** A noise canceling method comprising the steps of:

receiving a signal periodically including a zero-point,

establishing synchronization based on a received signal,

extracting the zero-point based on the established synchronization,

interpolating a noise component of the received signal by using the zero-point, and

subtracting the noise component from the received signal,

wherein the step of interpolating includes steps of performing a frequency shift of the received signal to a desired frequency bandwidth, decimating according to the zero-point, performing an interpolation, and finally performing the frequency shift in a reverse direction so as to adjust to an original signal, thereby generating the noise component of the received signal.

22. 21. **(currently amended)** A noise canceling apparatus comprising:

means receiving a signal periodically including a zero-point,

means establishing synchronization based on a received signal,

means extracting the zero-point based on the established synchronization,

means interpolating a noise component of the received signal by using the zero-point, and

means subtracting the noise component from the received signal,

wherein the means for interpolating include means for performing a frequency shift to the received signal to a desired frequency bandwidth, means for decimating according to the zero-point thereafter, means for further performing an interpolation, and means for performing the frequency shift in a reverse direction so as to adjust to an original signal, thereby generating the noise component of the received signal.